Technical Note – Forestry
North Carolina

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Planting, Culture, and Maintenance Requirements for Hardwoods

Planting hardwoods is more difficult than planting white pine or most yellow pines for a number of reasons. First, hardwood seedlings are typically much larger than pine seedlings. Second, site selection and competition control are more important when planting hardwoods. However, the rewards are great and include the production of high-value timber, mast production for wildlife, and improvements in water quality.

Following are some tips for successful planting gathered during NC Forest Service training sessions.

Problem Sites – Nutrient-enriched crop fields are particularly difficult to successfully establish. Piedmont sites that have shallow (or no) topsoil over clay subsoil, and coastal plain sites that have sandy topsoil underlain by sandy subsoil should be avoided.

Site Preparation – Recommended site preparation for planting crop fields includes mowing followed by broadcast or band treatment with herbicides. Subsoiling, and letting the soil settle before planting, is required when the field has a plow pan.

Seedlings – Undersized and defective seedlings should be culled. Oaks should have a minimum 8-inch taproot. Northern red oak should have 4-6 primary lateral roots (PLR) and white, water and willow oaks should have 2-3 PLR. PLRs should be a minimum of 1 mm. diameter. Minimum root collar diameter is 3/8 inch for oak and walnut and ¼ inch for all other hardwoods. Ash seedlings should never be “top clipped.”

Storage – Seedlings should be stored at 35-38 degrees F until planting. Refrigeration units can be rented and may be required for large planting operations.

Planting – Dibble bars commonly used for planting pines don’t work! They are too small. Appropriate tools include post hole diggers, planting shovel or sharpshooter, or KBC planting bar. Marking rows with a farm bedding plow or cutting lines with a machine planter before planting will mark the rows so that they can be located later. Machine planting works well for small to medium sized hardwoods. Tree shelters provide protection for newly planted seedlings, but will substantially increase establishment costs. In general, hardwood plantings of a scale that can be intensively maintained have the best chance of survival.

Culture and Maintenance – Most problems with survival are related to weed competition and the accompanying rodents (especially voles and rabbits) that live within the vegetation and gnaw on newly planted seedlings. Preplant chemical competition control and post-plant herbicide application with mowing are needed until the seedlings become established. Best results have been observed where chemicals have been band sprayed and the middles mowed (often twice per year) as recommended in the forest management plan. Following the forest management plan for herbicide application and mechanical culture is absolutely essential for successful hardwood planting.